FIG.1

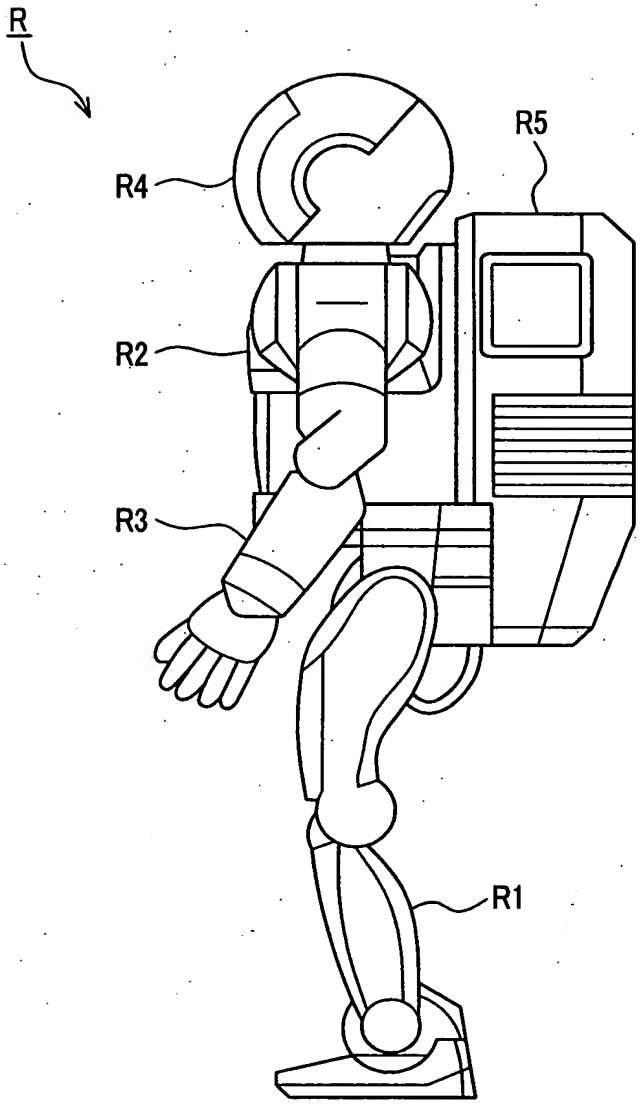


FIG.2

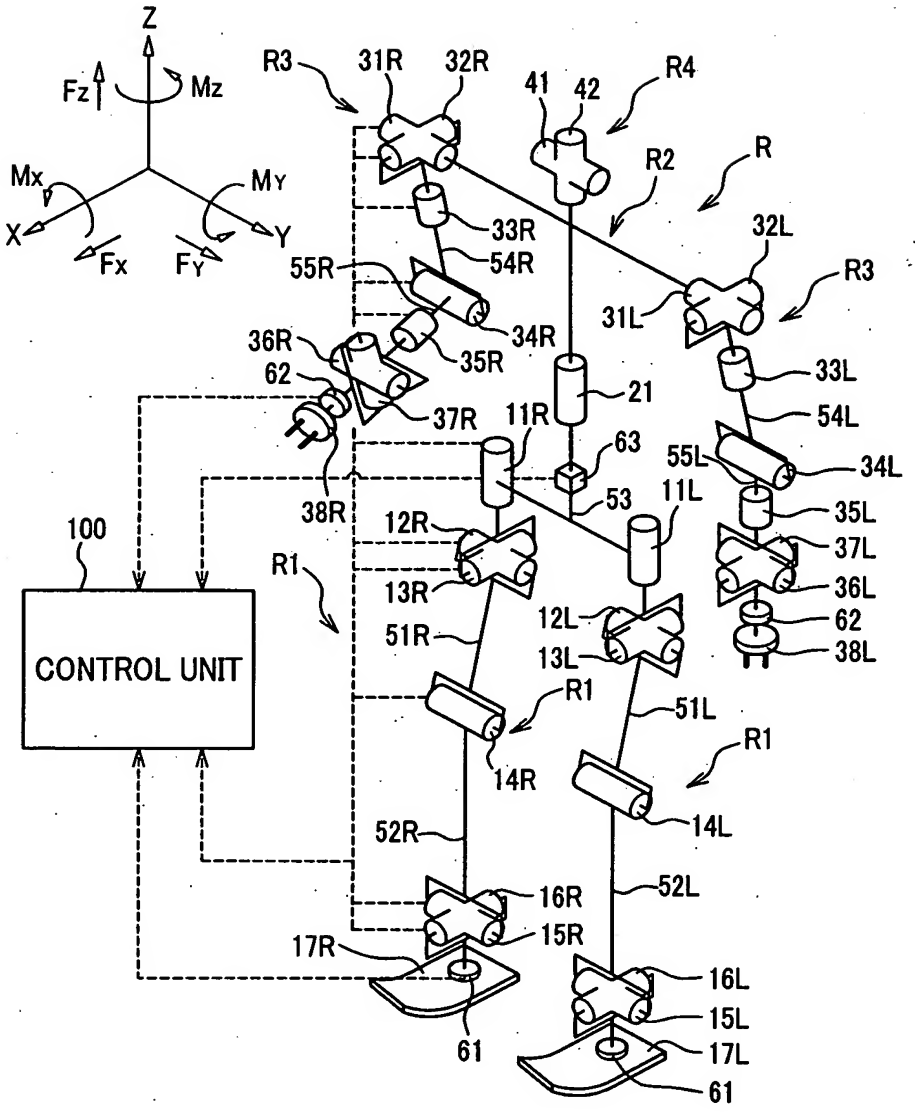

Z
Fz
Mz
Mx
My
X
Y
Fx
Fy
R3
31R
32R
41
42
R4
R2
R
32L
R3
31L
33R
54R
55R
34R
35R
36R
62
37R
38R
11R
21
63
53
11L
55L
34L
54L
33L
35L
37L
36L
62
38L
100
CONTROL UNIT
R1
12R
13R
51R
12L
13L
R1
51L
R1
14R
14L
52R
52L
16R
15R
17R
61
16L
15L
17L
61

FIG.3

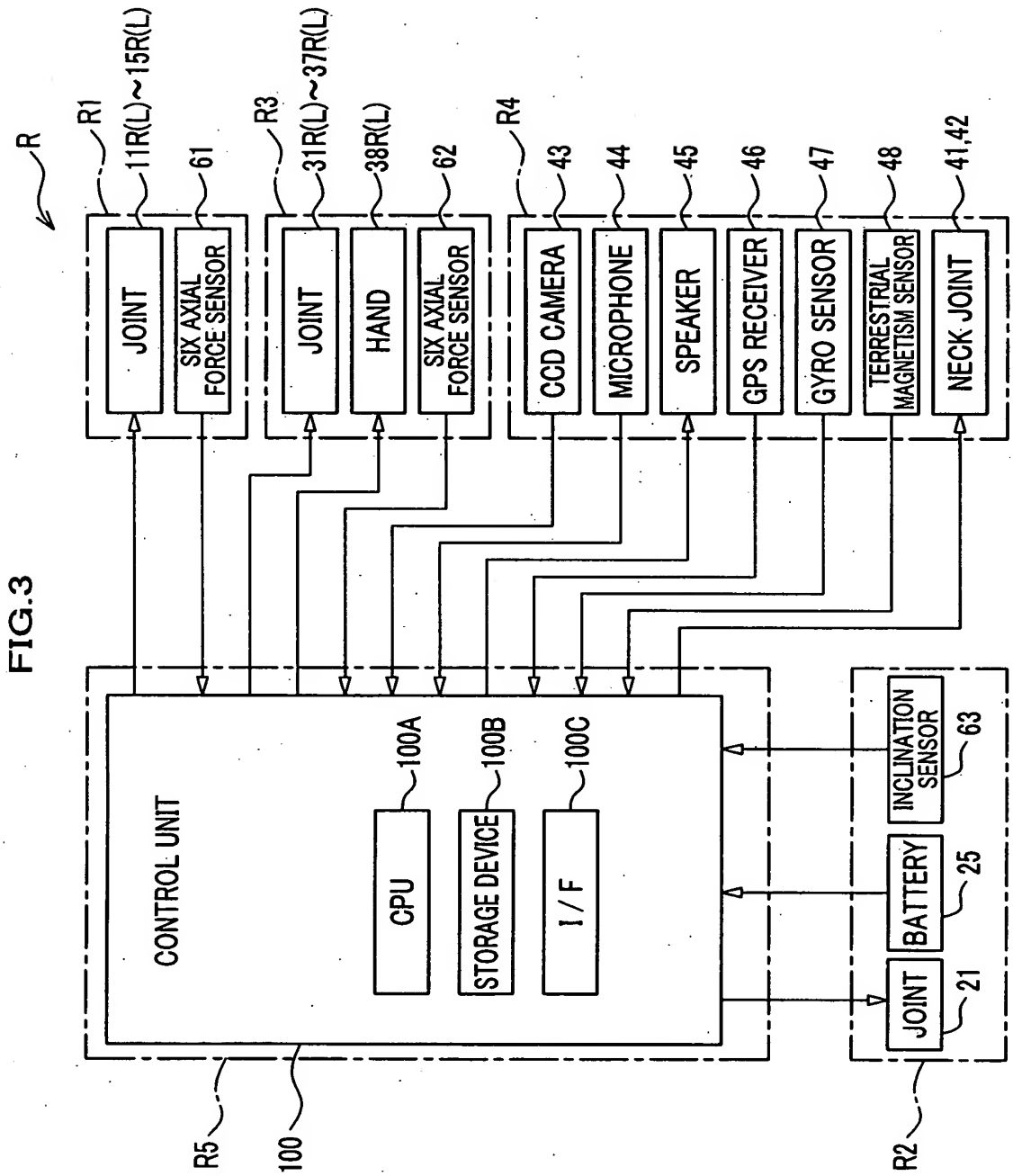

R
R1
11R(L)~15R(L)
61
R3
31R(L)~37R(L)
38R(L)
62
R4
43
44
45
46
47
48
41,42
JOINT
SIX AXIAL FORCE SENSOR
JOINT
HAND
SIX AXIAL FORCE SENSOR
CCD CAMERA
MICROPHONE
SPEAKER
GPS RECEIVER
GYRO SENSOR
TERRESTRIAL MAGNETISM SENSOR
NECK JOINT
CONTROL UNIT
100A
100B
100C
CPU
STORAGE DEVICE
I / F
INCLINATION SENSOR
63
BATTERY
25
JOINT
21
R5
100
R2

FIG.4

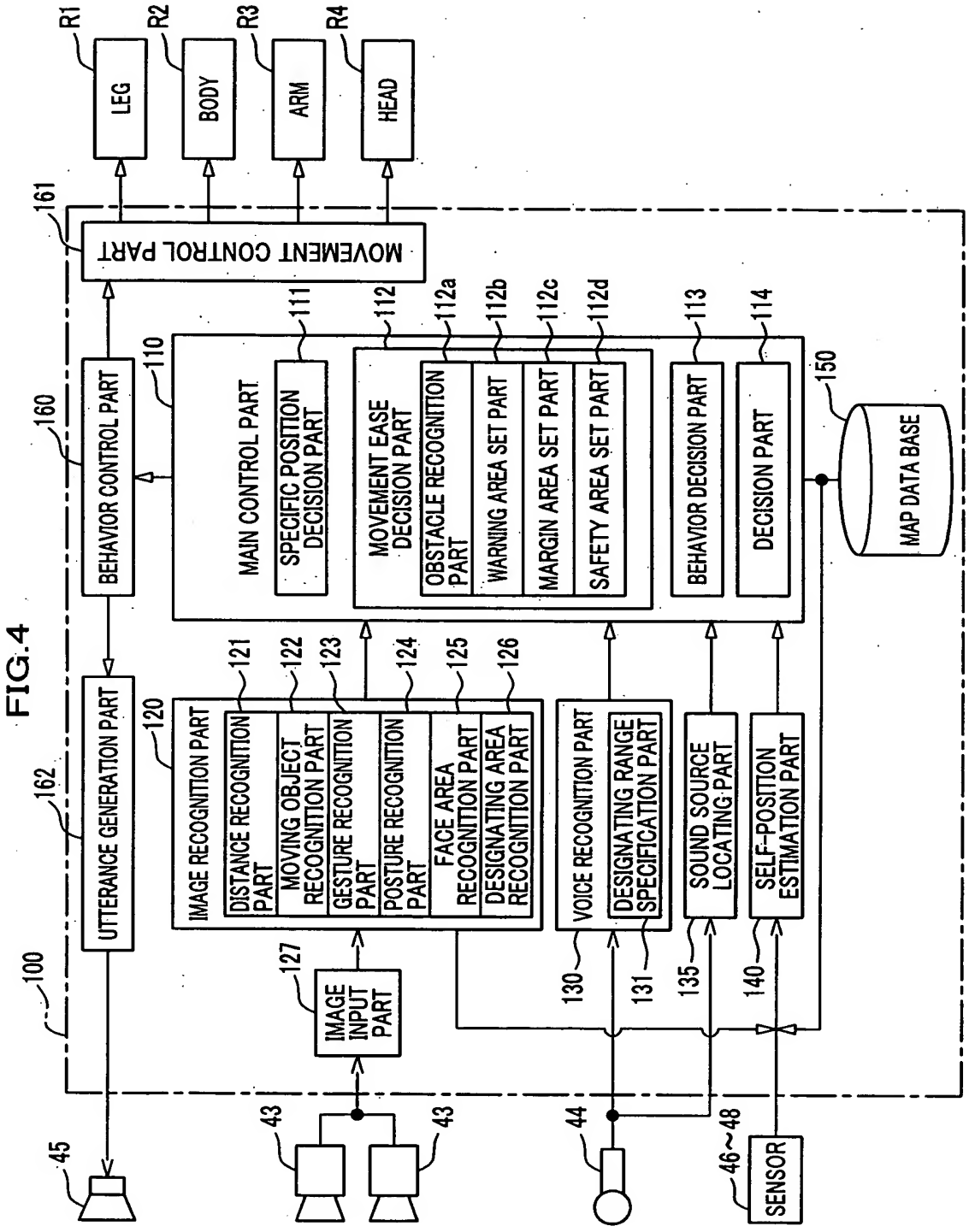

R1
LEG
R2
BODY
R3
ARM
R4
HEAD
161
MOVEMENT CONTROL PART
160
BEHAVIOR CONTROL PART
110
MAIN CONTROL PART
111
SPECIFIC POSITION DECISION PART
112
MOVEMENT EASE DECISION PART
112a
OBSTACLE RECOGNITION PART
112b
WARNING AREA SET PART
112c
MARGIN AREA SET PART
112d
SAFETY AREA SET PART
113
BEHAVIOR DECISION PART
114
DECISION PART
150
MAP DATA BASE
162
UTTERANCE GENERATION PART
120
IMAGE RECOGNITION PART
121
DISTANCE RECOGNITION PART
122
MOVING OBJECT RECOGNITION PART
123
GESTURE RECOGNITION PART
124
POSTURE RECOGNITION PART
125
FACE AREA RECOGNITION PART
126
DESIGNATING AREA RECOGNITION PART
127
IMAGE INPUT PART
130
VOICE RECOGNITION PART
131
DESIGNATING RANGE SPECIFICATION PART
135
SOUND SOURCE LOCATING PART
140
SELF-POSITION ESTIMATION PART
100
45
43
43
44
46~48
SENSOR

FIG.5

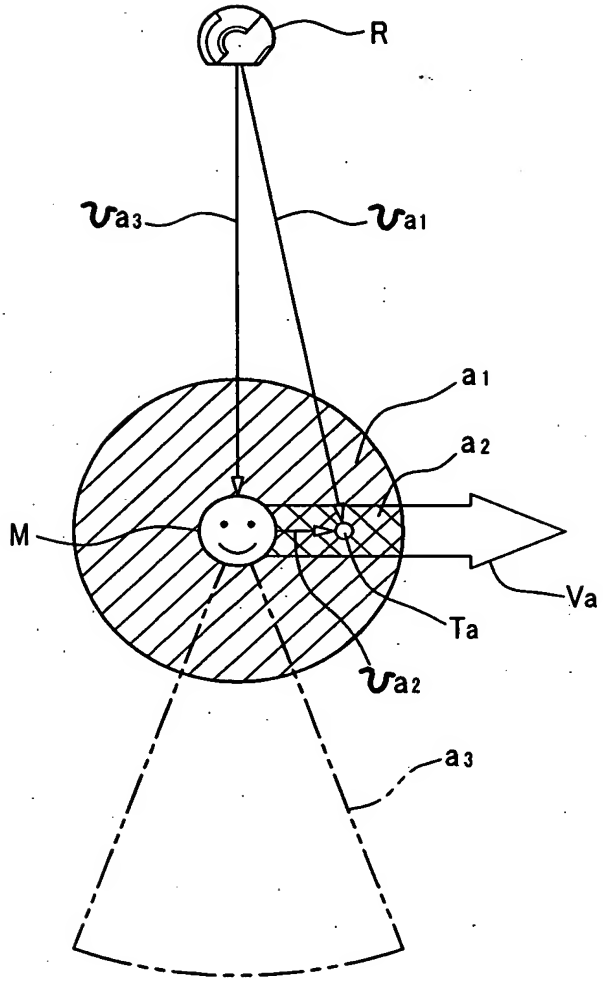


FIG.6

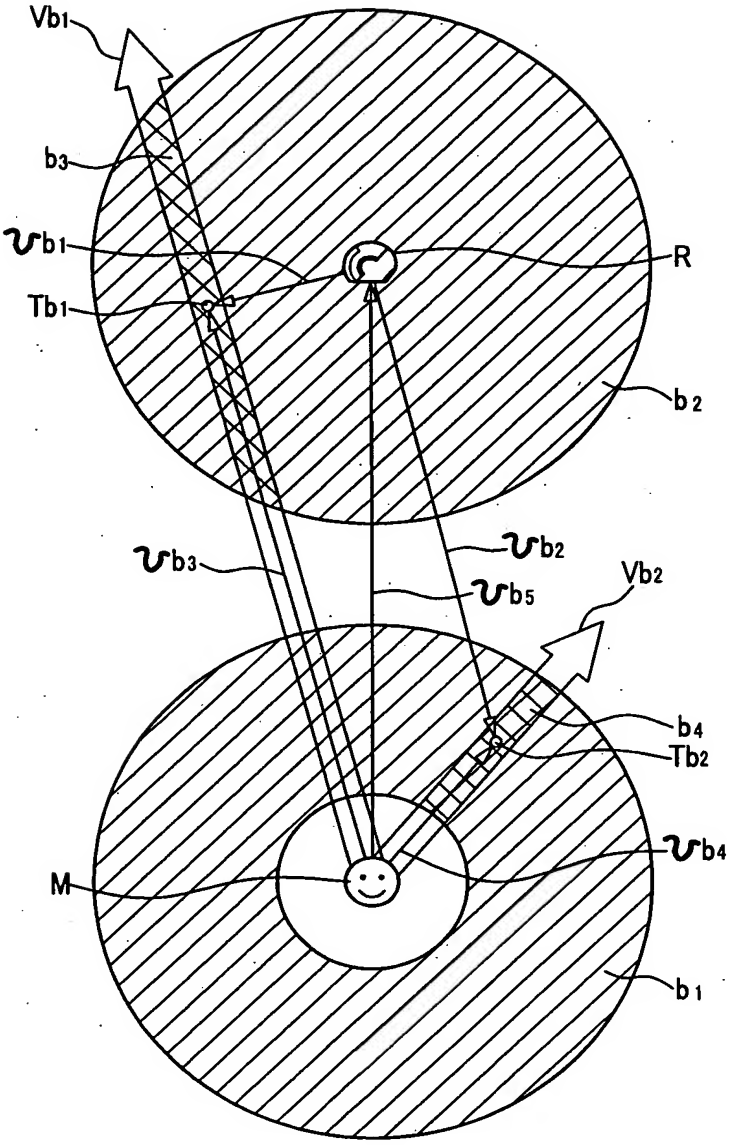


FIG.7

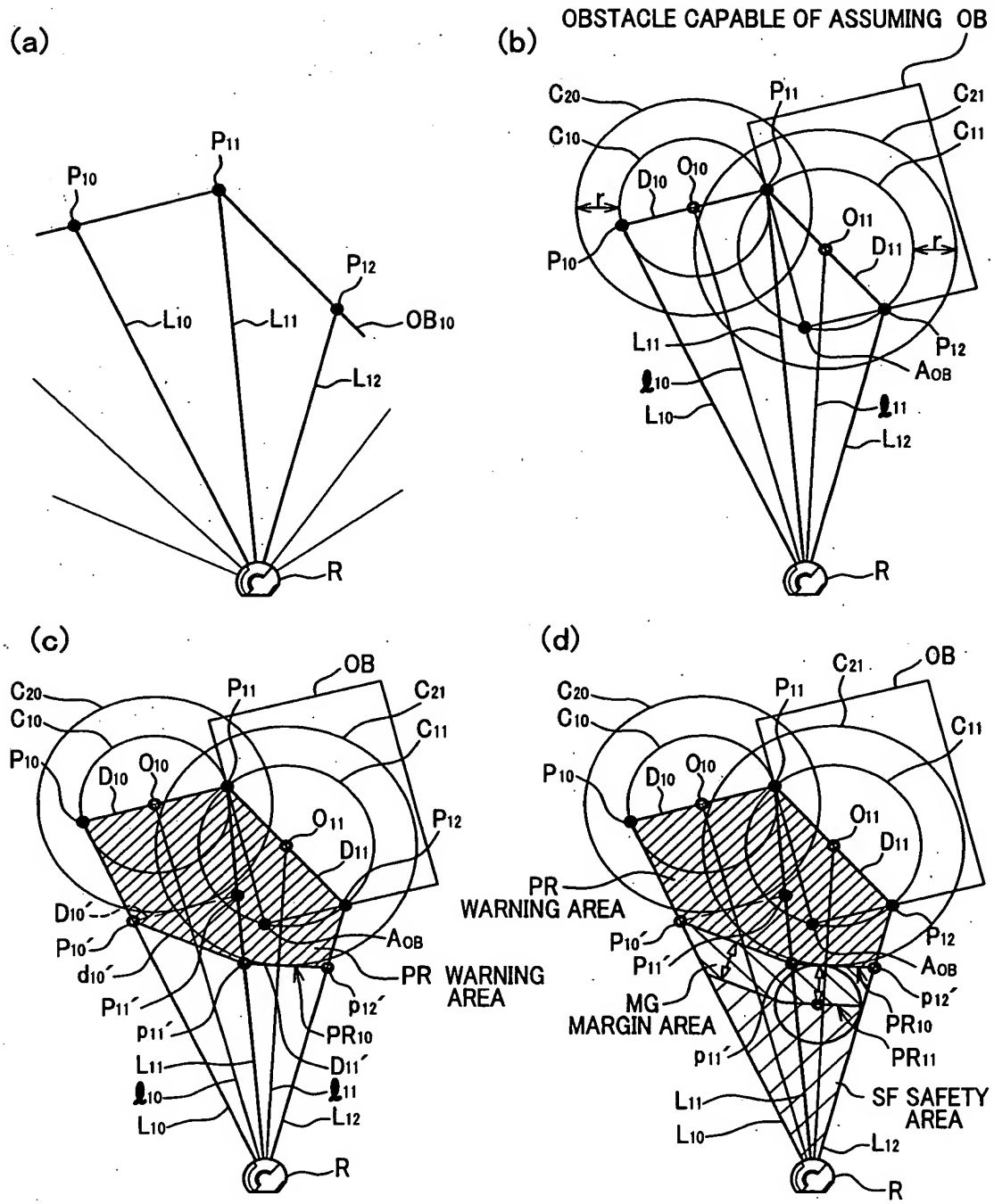

(a)
P10
P11
P12
L10
L11
OB10
L12
R
(b)
OBSTACLE CAPABLE OF ASSUMING OB
C20
C10
P11
C21
C11
D10
O10
r
O11
D11
r
P10
L11
P12
AOB
L10
L12
R
(c)
OB
C20
C10
P11
C21
C11
P10
D10
O10
O11
D11
P12
D10´
P10´
d10´
AOB
PR WARNING AREA
P11´
p12´
p11´
PR10
L11
D11´
L10
L12
R
(d)
C21
OB
C20
C10
P11
C11
P10
D10
O10
O11
D11
PR WARNING AREA
P10´
P12
P11´
AOB
MG MARGIN AREA
p12´
PR10
p11´
PR11
L11
SF SAFETY AREA
L10
L12
R

FIG.8

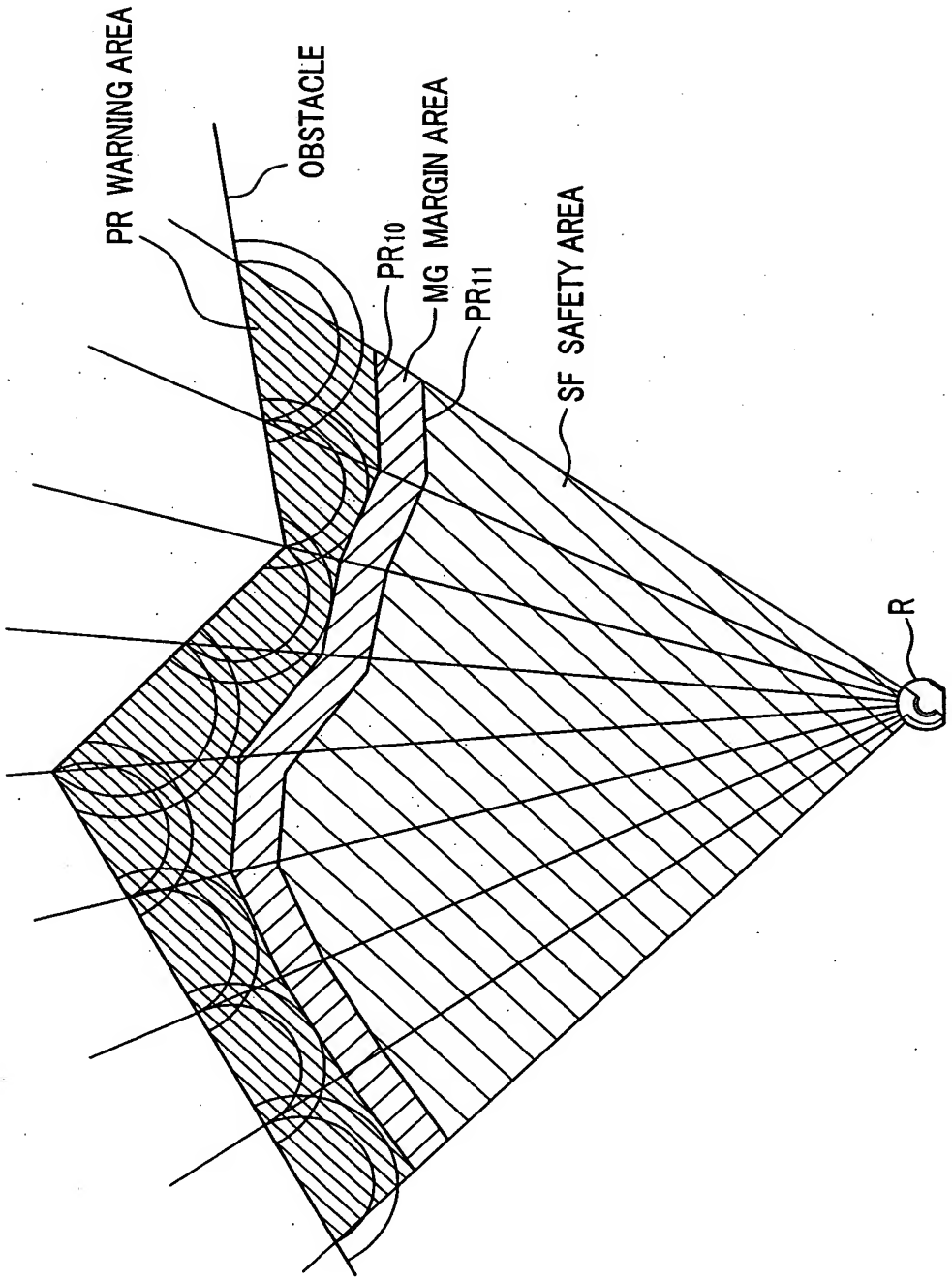

PR WARNING AREA
OBSTACLE
PR10
MG MARGIN AREA
PR11
SF SAFETY AREA
R

FIG.9

PROCESSING UNTIL DESIGNATION IS RECOGNIZED

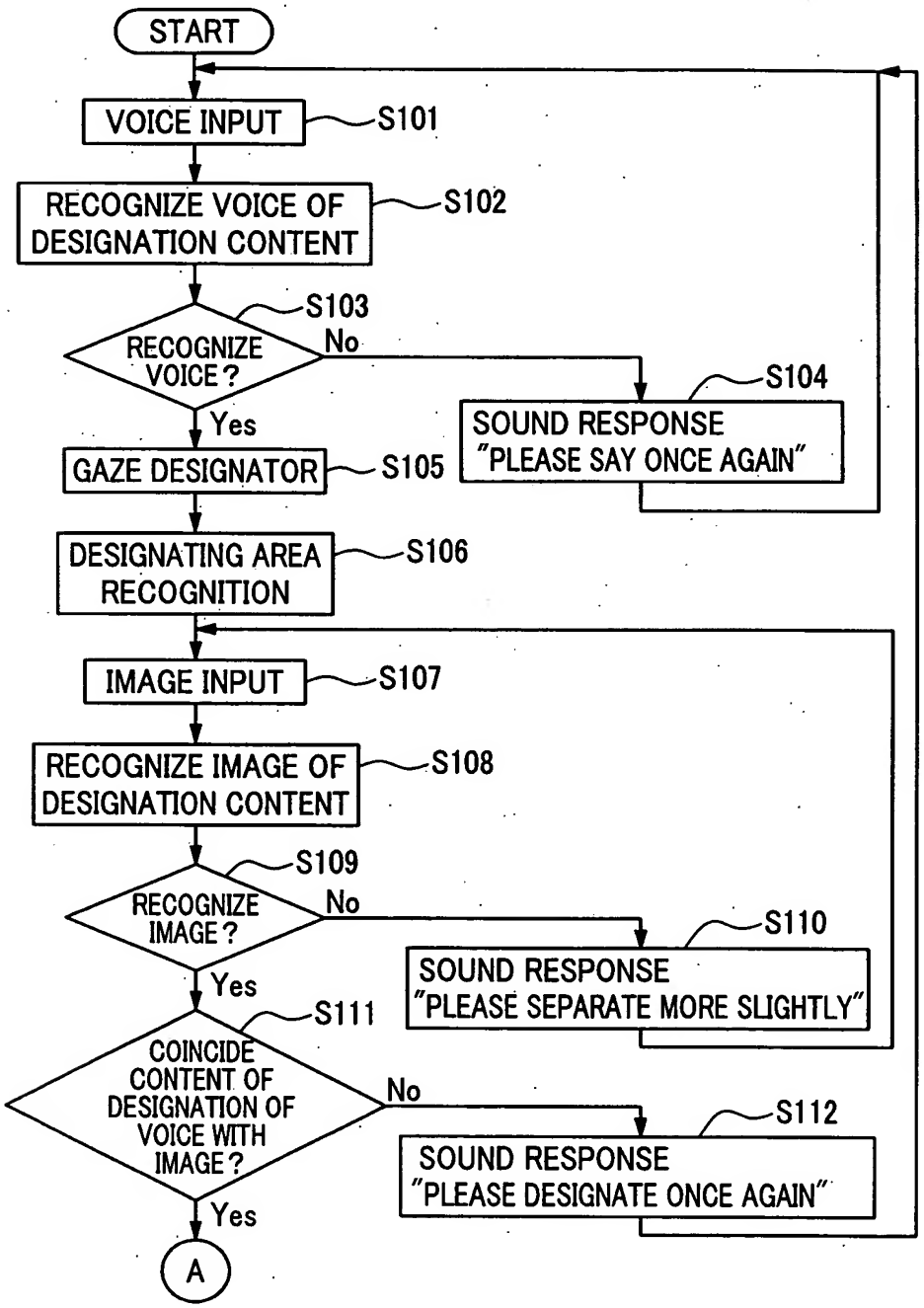
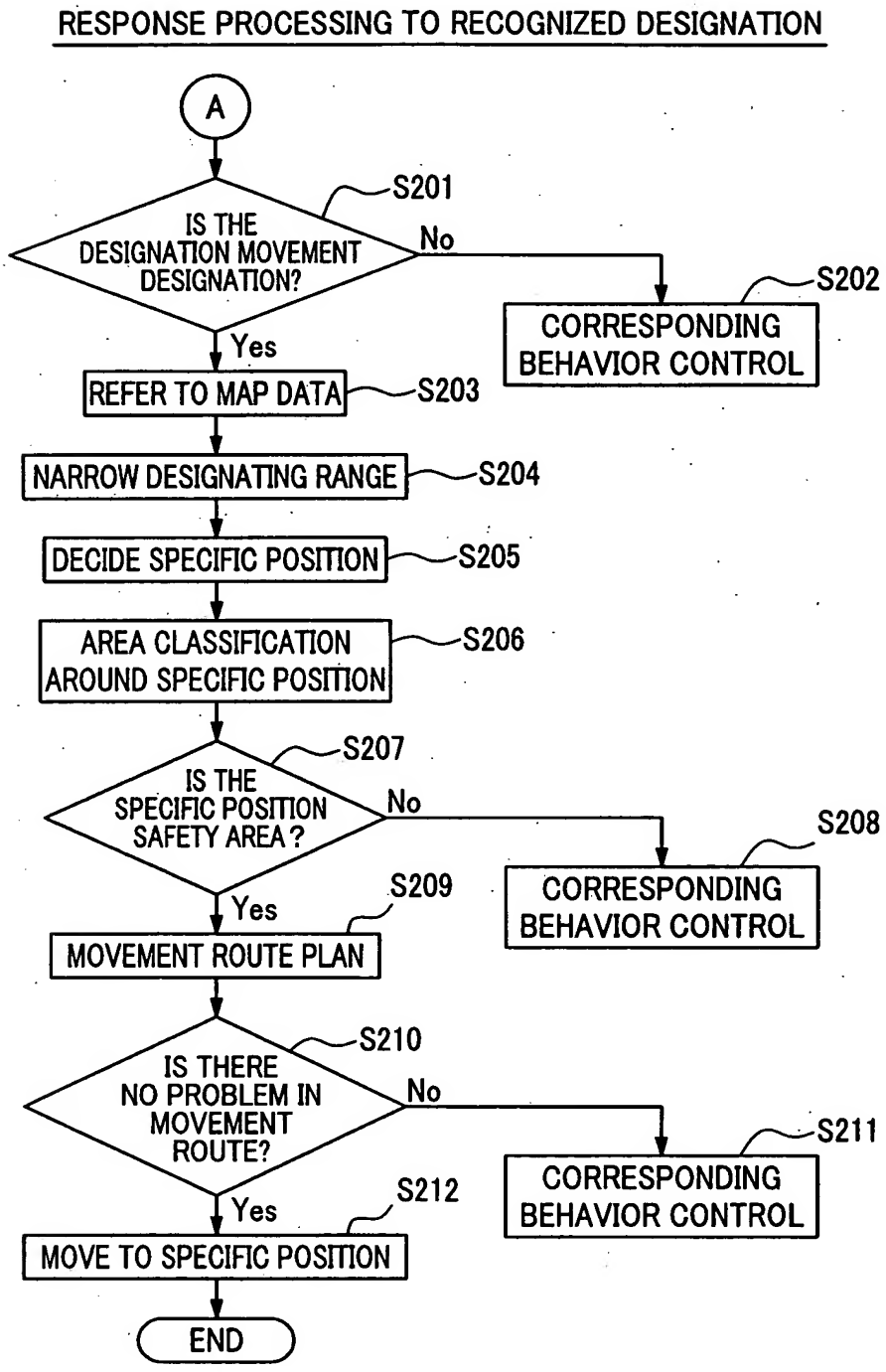


FIG.10


RESPONSE PROCESSING TO RECOGNIZED DESIGNATION
A
S201
IS THE DESIGNATION MOVEMENT DESIGNATION?
No
S202
CORRESPONDING BEHAVIOR CONTROL
Yes
REFER TO MAP DATA
S203
NARROW DESIGNATING RANGE
S204
DECIDE SPECIFIC POSITION
S205
AREA CLASSIFICATION AROUND SPECIFIC POSITION
S206
S207
IS THE SPECIFIC POSITION SAFETY AREA?
No
S208
CORRESPONDING BEHAVIOR CONTROL
Yes
S209
MOVEMENT ROUTE PLAN
S210
IS THERE NO PROBLEM IN MOVEMENT ROUTE?
No
S211
CORRESPONDING BEHAVIOR CONTROL
Yes
S212
MOVE TO SPECIFIC POSITION
END